CONFERENCES

IMPERIAL AGRICULTURAL RESEARCH CONFERENCE, 1927.

REFERENCE ONLY

Agenda: Memorandum 1.

Recruitment, Training and Interchange of Workers.

BUREAU OF AGRICULTURAL DEVELOPMENT

Issued by the Organising
Committee of the Conference,
10, Whitehall Place,
London, S.W. 1.

September, 1927.

LONDON:
PRINTED UNDER THE AUTHORITY OF HIS MAJESTY'S STATIONERY OFFICE
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AGENDA : MEMORANDUM 1.

Recruitment, Training and Interchange of Workers.

The questions for consideration are how far it is desirable and practicable that arrangements on an Imperial basis should be made for the recruitment, training and interchange of research workers in agriculture and what these arrangements should be.

The existing position in regard to the supply, recruitment and training of research officers for the scientific departments of the Empire was considered by a special Sub-Committee of the Imperial Conference in 1926. Part II of the Committee's Report is re-printed as Appendix Paper 1.

Recruitment.—Particulars of schemes of recruitment of research workers for Great Britain and the Colonies are given in Appendix Paper 2.

Since the inception of the research institute and advisory schemes the agricultural research workers and advisory officers in Great Britain have been recruited largely by means of research scholarships, which have proved extraordinarily successful for the purpose. Of 80 research scholars still living, 62 are still engaged in research, advisory and teaching work in this country or in the Overseas Empire (and of these very few occupy teaching posts). Many of the outstanding research and advisory workers in this country have been recruited in this way. It has been found necessary to award up to ten scholarships annually, and it is probable that the annual casualties in the research and advisory services in Great Britain will necessitate the award of fully as many as this number in the future.

In 1925, following the report of a Committee, of which Lord Milner was Chairman (until succeeded on his death by Lord Lovat), a scheme of scholarships was initiated by the Colonial Office for the non-self-governing Dependencies. Sixteen to eighteen scholarships in Agriculture and Agricultural Science are at present being awarded annually, so as to form a pool from which vacancies in the Colonial Agricultural Departments can be filled. A similar scheme of scholarships has been established by the Empire Cotton Growing Corporation.

(1438) Wt. P. 1245—2248. 400. 9/27. Wy. & S. Ltd. Gp. 2.

Particulars of both these schemes are given in Appendix Paper 2 ; whilst Appendix Paper 3 gives an account of the working of the Colonial Office Scheme up to the end of its second year.

It will be understood that the Colonial Office and the Empire Cotton Growing Corporation award more than half of their scholarships to candidates who intend to take up the administrative side of agriculture rather than research.

No particulars have been received of research scholarships awarded by the Dominion Governments. No doubt delegates from the Dominions will be able to supply the Conference with information concerning any schemes which may be in operation.

It should be made clear that there is at present no co-operation in regard to the award of scholarships between the Colonial Office, the Ministry of Agriculture and Fisheries, the Board of Agriculture for Scotland, and the Empire Cotton Growing Corporation, beyond the issue of the joint notice which is printed as Appendix Paper 2. This notice is circulated to schools, colleges, Universities and other institutions throughout the country.

Particulars of vacancies in Research Institute and Advisory Centre staffs in England and Wales are circulated amongst the research scholars of the Ministry ; and this arrangement could perhaps with advantage be extended to Scotland. In present circumstances it does not appear that any useful purpose would be served by circulating these particulars to Colonial Office scholars, who at as early a date as possible in their course will be specially trained for definite vacancies as soon as these can be foreseen, or by circulating particulars of Colonial Office vacancies to the Ministry and Board of Agriculture for Scotland scholars.

If the Conference agrees that a scheme of research scholarships is a desirable method of recruitment of officers, the main question for discussion would appear to be whether an attempt should be made to merge present scholarship schemes in an Imperial scheme.*

An Imperial scholarship scheme would seem to necessitate agreement as to :—

(1) The annual number of vacancies to be catered for in different subjects.
(2) Qualifications necessary in candidates in view of the different Universities from which they would be drawn.
(3) The grouping of countries for the functioning of selection bodies for the preparation of short lists.
(4) The composition of any Imperial body making the final selection from the short lists ; perhaps constituted from

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* It will be seen from Appendix Paper 4 that a Colonial Office Committee is at present considering the feasibility of creating a Colonial Agricultural Scientific and Research Service which would be available for the requirements of the whole Colonial Empire.

representatives of the different Bureaux, Government Departments and High Commissioners.

(5) The arrangements for training (see later section).

(6) And—perhaps most important of all—the question as to whether scholars would be bound to accept employment, if offered, for a term of years and, if so, the extent to which they should be entitled to restrict the area to which they would be liable to be allocated.

An Imperial scholarship scheme would also seem to involve the circulation among all available scholars of particulars of vacancies in their specialist subjects; and it would probably also have to be agreed that vacancies throughout the Empire should not be filled until scholars had had an apportunity of applying.

It appears difficult to bring the Dominions and India into a general scheme: their position differs from that of the Colonies. The latter have practically no training institutions of University status of their own, and naturally look to this country as their primary field of recruitment. The Dominions and India, on the other hand, have their own sources of supply of young graduates with a good, scientific training, and would expect that their Research Service shall be staffed to the utmost extent possible from their own people. Again, the administrative difficulties of working a scheme of selection for the whole Empire would obviously be great: how, for instance, could it be conveniently and easily secured that justice should be done between the competing claims of young chemists from Sydney, Montreal, and Cambridge? The best means of selection—personal interview or private discussion with the candidates' tutors—would be impossible.

These difficulties might, however, conceivably be overcome.

Training of scholars.—(Training is used to refer to post-graduate work previous to obtaining a post as research worker.) The training of research scholars of the Ministry and Board of Agriculture for Scotland consists of two years' work at a research institute in this country and one year at a research institute or laboratory abroad. The year abroad has usually been spent in the United States or on the Continent. The training of Colonial Office research scholars is of two years' duration. One year is spent in this country at research institutes and the second year at the Imperial College of Tropical Agriculture, Trinidad. If an Imperial body is set up for the selection of scholars it might also arrange for their training, and in this connection it should make use of Empire facilities* when arranging programmes of work. The amount of the scholarship allowances would need to be fixed with reference to the country in which the scholarships were tenable, and the finance of any Imperial scholarship scheme would need careful consideration.

*A brief account of the facilities offered by the Empire countries is given in (1) Agricultural Research in Great Britain and Northern Ireland, (2) Agricultural Research in the Overseas Empire.

Interchange of Workers.—It is necessary under this heading to distinguish between three separate questions :—

(*a*) Visits by workers of standing to other parts of the Empire to familiarise themselves with the progress of research and the development of technique in their own special subjects, or subjects connected with them.

(*b*) Attendance at Research Institutes by comparatively junior workers on study leave, whether for definite courses of instruction or simply for the opportunity of working at the Institutes and seeing how things are done.

(*c*) Interchange for fairly long periods (two or three years or more) between workers who for the time being really become members of the staffs of the Institution into which they are " interchanged."

On these three matters :—

(*a*) is scarcely " interchange," and needs little comment. In Great Britain a certain sum of money is provided annually for the award of grants to research and advisory workers, to enable them to pay visits to Research Institutes, &c., abroad, and also to enable them to attend International Conferences on their own subjects. These " Travelling Research Fellowships " have usually been of three months' duration and £250 in value and have been mainly tenable in the United States. Fellowships of less value for similar periods have also been awarded for visits to the Continent. As a rule some half-dozen Fellowships are awarded annually in Great Britain together with a few grants for expenses of attendance at annual Conferences. In future arrangements for these Fellowships the facilities available in the Empire will, of course, be borne in mind.

It seems desirable that such a system of Fellowships should be general throughout the Empire. The Research Sub-Committee of the Imperial Conference attached much importance to the provision of study-leave for the purpose (see Appendix Paper 1 ; and also Appendix Papers 5 to 11). Financial assistance might possibly be obtained from such a source as the Empire Marketing Board.

It may presumably be taken that anywhere in the Empire visitors of this kind would be welcomed and given every facility, free of charge, to see what is happening. It is clear that the expenses of such visits should be borne by the Institution from which the visitor comes.

If, however, it should happen that a picked officer is sent to visit Institutes throughout the Empire dealing with his own subject, in order to assist the staffs of these latter Institutes, the cost could hardly fall on the Institution from which he came. It would presumably be borne either by the countries which he visits, or else by a special grant from such a source as the Empire Marketing Board.

(*b*) again is scarcely "interchange" but presents rather more difficulties. Research Institutes often have no really suitable accommodation for the instruction of any considerable number of students; and teaching or lecturing takes away a worker from his permanent duties. Again there are administrative and financial questions to be settled. In this connection it will be remembered that in Great Britain Research Institutes are usually governed by, and are parts of, Universities and therefore are not autonomous in such matters as laboratory fees.

An idea of the facilities available in each country for research into the various subjects by men on study-leave can be obtained from two Conference publications, on Agricultural Research in Great Britain and Northern Ireland and in the Overseas Empire respectively. The last few years have witnessed important developments in animal diseases research in this country: a special statement is therefore included in the Appendix (Paper 12) of facilities in this subject in Great Britain.

No doubt the representatives of the various parts of the Empire at the Conference will express their wishes in this matter, and the authorities responsible for Research Institutions will do their utmost to meet them.

(*c*) The proposal under this heading is novel, and needs exploration. Probably cases would not be frequent, and details could be settled individually between the Institutions concerned as cases arise. The general principle might perhaps be that the Institute to which a man belongs permanently would continue to pay his salary, but that the Institute to which he is temporarily attached would bear all other expenses, including any addition necessary on account of the varying cost of living (see the memorandum of the Division of Chemistry, Department of Agriculture, Union of South Africa—Appendix Paper 8).

On the point as to who is to take the initiative in such interchanges, it looks as if this will need to be left to the Directors of individual Research Institutes, and to the individual workers. It would seem impossible for an outside body or persons to compel interchanges, if either the Institutes themselves or the men concerned were unwilling. But perhaps the Governing Bodies and Directors of Research Institutes throughout the Empire might be asked to bear in mind the possibility and advantages of such interchanges: and the larger Institutions might make it a rule that they would be prepared always to have at least one member of their staff serving in another part of the Empire, and a member of another Institution taking his place.

Section II.—The Recruit and his Training.

19. A scientific officer must possess first-rate intellectual ability, a sound knowledge of his subject and, wherever possible, that *flair* for investigation which, while it eludes definition, is indispensable to the accomplishment of all distinguished work in research. It is also important that members of any Government service should possess those qualities of character which both command respect and enable them to work smoothly with their colleagues.

20. Where an officer brought up in a temperate climate is to be employed in the tropics, special weight should be given to qualities of character, temperament and physique. Experience shows that tropical conditions of life expose men to stresses which do not operate to the same extent in a temperate climate. It is not merely a matter of rejecting the medically unfit. It is also necessary to make every effort to select men whose temperament, tastes and habits will help them to keep fit.

21. The Sub-Committee recommend, therefore, that in recruiting for the scientific services, the method of choice should be that o personal selection, combined with whatever test of intellectual ability or technical knowledge may seem appropriate.

22. Without going into the training of the recruit in detail the Sub-Committee wish to emphasise the following points, to which great importance is attached :—

(*a*) The first requisite in a candidate for scientific service is a thorough grounding in science in its broadest aspects. It is only on the basis of such a training as is or should be given by a well conceived honours course in science at a university that a superstructure of specialised training can, as a rule, be soundly built.

The Sub-Committee welcome the increasing importance which universities are attaching to research, and the tendency to emphasise the essential connection between higher teaching and research work.

(*b*) Specialised study necessary for scientific officers should be mainly of a post-graduate nature.

(*c*) In accordance with the usual practice of universities, such specialised study should be taken under men who are themselves engaged in research in the fields concerned.

23. In concluding this section the Sub-Committee express emphatically the opinion the every effort should be made to attract candidates of the highest class, and to equip them with the best possible training. To employ men of inferior calibre will result in waste of opportunity, time and money.

Section III.—Reasons for Shortage of Men and Suggested Remedies.

24. A distinction must be drawn between the shortage of men between, say 26 and 35 years of age, who would normally be filling intermediate posts, and the shortage of recruits. The former is due to casualties in the War, and to the long break which it caused in the normal output of the universities. It is, therefore, a temporary evil and, provided that an adequate supply of recruits can be ensured, will in time automatically cease. Its effects will, however, be felt for some time yet, and they emphasise the need for assisted post-graduate training, which is discussed below (paragraph 35).

25. The shortage of recruits is a more complex matter, but the Sub-Committee consider that the principal reasons for it are :—

(*a*) The wholly inadequate appreciation of the importance and value of scientific research on the part of the public, of the press and even of Governments themselves.

(*b*) The uncertainty in the minds of men embarking on a university course as to the amount, interest and continuity of the employment which will be available in their branch of science when they have completed their studies.

(*c*) The increasing demand by private employers for scientific men with a university training. This creates a temporary difficulty, but will in the long run prove beneficial, by increasing the number of openings available and inducing Governments to make their services attractive.

(*d*) In certain cases, the lack of flexibility in the examination requirements of professional bodies which limits the discretion of students to modify their courses in order to qualify for special employment, as, for instance, in regard to veterinary science in Great Britain.

(*e*) The lack of knowledge shown by educational institutions and parents of the increasing number of careers available, particularly in services overseas, in the various branches of science. The Sub-Committee call attention here to the unduly small number of young men who are studying the biological sciences, other than medicine, and attribute it to ignorance on the part of educational institutions and parents of the careers now open to men with these qualifications.

(*f*) The ignorance of the special attractions which service overseas offers, such as the host of new and interesting scientific problems that awaits solution, the greater responsibilities which attach to junior posts and the open-air-life.

26. It is the considered opinion of the Sub-Committee that the basic remedy is the adoption of a settled policy in regard to the application of research to development in the various parts of the

Empire. Granted such a policy, many difficulties will be removed; continuity of work will be ensured, confidence will be established and educational institutions will feel free to encourage students to take up appropriate lines of training and parents will be more ready to incur the necessary expense.

27. It may be urged that, owing to financial stringency, it is unwise to embark on such a policy. The Sub-Committee do not agree; on the contrary, they consider that the poorer a country is the greater its need to develop and employ its scientific resources to the fullest extent. This is particularly true for the Empire with its enormous potential resources, which cannot be fully developed without the aid of science. Germany, in the 19th century, provided a classic instance of the way in which a comparatively poor country can, by the organised application of scientific research, immensely increase its wealth and power and rapidly overhaul neighbouring nations possessed of greater natural advantages.

28. The conditions offered by Government service must be such as to attract the best men and offer them good avenues for promotion, either in the service or elsewhere. Status and recognition must be considered as well as material conditions.

29. Salaries should be sufficient to enable men to meet the normal requirements of life and of their position at each stage of their career. At the start they must be enough to command independence. The incremental scale should then rise sufficiently sharply to allow a man to marry at a reasonably early age. It must be remembered that, owing to the length of their training, many scientific officers enter the service at a later age than their contemporaries in other kinds of work. The scale must rise high enough to ensure that men who do good service, but who do not secure exceptional positions, should be able to educate their children and retire on an adequate pension. And, perhaps most important of all, there must be a sufficient number of posts carrying a high salary and responsible duties to attract ambitious men who are conscious of possessing unusual powers.

30. While it is very desirable that, in suitable cases, research officers should obtain high administrative appointments, it is important that the interests of men who remain on the research side should be safeguarded by the provision, in their own sphere, of rewards comparable as to pay, status and recognition.

31. It is particularly important that officers should be relieved of financial and similar worries and be set free to concentrate on their work. This consideration applies with special force to tropical services.

32. Material conditions apart, care must be taken to see that scientific officers should be accorded the status, *vis-a-vis* their colleagues in other branches of the public service to which their

value entitles them. It is also important that men who have done valuable work abroad should have full consideration for good appointments in their own country; otherwise the popularity of overseas services will be affected by the fear that those who enter them may suffer in comparison with men of, perhaps, less ability who stay at home and run less risk of being forgotten. There is especial need of a more effective linking between the various scientific services so that good work done by men in all parts of the Empire may be brought to notice.

33. The importance to Research Institutions of having on their staffs men with experience of different parts of the Empire can hardly be exaggerated. It is, therefore, important to provide for the free interchange of both recruits in training and officers. There is far from enough interchange of officers between different services. The principal difficulties arise from the variety of pension schemes and terms of service in force. The Sub-Committee strongly urge all Governments to adopt a liberal attitude towards the seconding of men for long periods, and to take all possible steps to facilitate interchange and transfer.

34. The Sub-Committee attach importance to the provision of facilities for study-leave to enable officers to keep in touch with the latest developments in their branch of science. The Sub-Committee also recommend that picked officers should be given every facility to hold travelling fellowships for study, on the spot, of the highest developments of work in particular fields.

35. To meet the special exigencies of post-war conditions several Government services offer Probationerships or Scholarships to selected men. A Probationer is selected after he has taken his degree, and is promised an appointment on the satisfactory conclusion of a prescribed course of post-graduate training. Scholarships are given for the same purpose and at a similar stage of education, but do not carry a definite promise of employment.

36. The Sub-Committee are of opinion that both methods are useful as a temporary measure, and that, indeed, without them it would be impossible to meet existing demands. It cannot, however, be too clearly stated that in the long run the Government services in question, like other Government services, must rely for recruits on their own intrinsic attractions; special inducements offered at an early stage to tempt young men into a profession cannot make up for inherent deficiencies in the prospects which that profession can provide in salary, pension, status and opportunities.

37. Scholarships or Probationerships will probably always be necessary to encourage men to train for a few services where there are practically no adequate rewards outside Government service, and also where highly specialised training is required for services in which few openings are available.

38. These systems have several advantages from the point of view both of the state and of the recruit and his parents. So far as the State is concerned, they have been found to attract a better field of candidates than was the case without them. They make it possible to secure promising men who are too young for immediate appointment, especially to tropical services, before they go into other employment. They enable a far more complete test to be applied to candidates before final appointment, and fit officers to give better service during the early part of their career. It may reasonably be expected that in these ways much of the money spent on Scholarships and Probationerships will, in reality, be recouped.

39. The Scholarship system creates a pool from which vacancies can be filled as they occur, and the serious obstacle to recruitment previously caused by fluctuations in the demand is largely offset by the fact that a fixed number of attractive scholarships can be counted on annually over a period of years.

40. From the point of view of the recruit and his parents a Scholarship provides the former with an extended education at a reduced expense, thereby giving time for additional scientific training before specialisation, and subsequently an opportunity of specialised work under research workers of standing.

41. It is the opinion of the Sub-Committee that, given a settled policy and attractive conditions of service, the educational centres will adapt themselves to produce the men required. But they will not do so—and much money can easily be wasted over improved salaries and scholarship schemes—unless possible recruits, their parents and their instructors are made fully aware of the careers available in the scientific services. The Sub-Committee therefore attach great importance to the organisation of the right kind of publicity.

42. Government Departments in many parts of the Empire have made great efforts to circulate appropriate information, particularly in the universities ; but it is clear that they have not yet achieved their object, and the Sub-Committee recommend further developments on the following lines. In the first place there is no comprehensive publication from which parents can obtain full information as to the openings available in all services and the qualifications required. If an official publication of this kind could be issued and brought periodically up to date, it should prove of considerable value. Secondly, in many parts of the Empire greater efforts should be made to reach the principal schools as well as the universities.

43. Many university institutions already have Appointments Boards or Committees, and at a few schools, it is believed, successful attempts are made, either by the headmaster or by some master specially deputed for the purpose, to advise boys about their careers. The Sub-Committee think, however, that in general a good deal could still be done, both in some universities and in many schools,

to improve the arrangements which now exist for directing the attention of young people to suitable openings and vacancies. It is unnecessary to stress the advantage to all concerned of a single recognised channel in a university or school through which information concerning Government scientific services can be distributed and enquiries made.

44. Finally, the Sub-Committee call attention to the great part the Press can play in bringing home to the public the importance of science to the Empire and the careers which it offers, thus encouraging parents and others concerned to enquire into the openings for men of scientific attainments, and the best means of preparing for such posts.

45. The Sub-Committee believe that the proposals made in this part of their Report are of the greatest importance, and they suggest that the Imperial Conference should consider a resolution* framed on the following lines :—

> "The Conference recognises that the progress of scientific research and its effective application to the development of the Empire depends ultimately on an adequate supply of well-trained scientific men; and that the utmost care is needed in devising suitable conditions for the selection, training and employment of scientific staffs appointed or aided by Government. Accordingly, the Conference commends part II of the Report of the Research Special Sub-Committee and the suggestions therein contained to the favourable consideration of the respective Governments."

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2. POST-GRADUATE AGRICULTURAL SCHOLARSHIPS.

Offered by the Colonial Office, The Ministry of Agriculture and Fisheries, The Board of Agriculture for Scotland, The Empire Cotton Growing Corporation.

[This leaflet will be issued separately to Members of the Conference.]

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3. COLONIAL OFFICE CONFERENCE, 1927; MEMORANDUM BY THE PRIVATE SECRETARY FOR APPOINTMENTS.

Recruitment and Training of Colonial Civil Servants.

17. *Agriculture, and Scientific Services connected with it.*

The case of the Agricultural Departments was next taken up.

In 1920, on the recommendation of the Committees appointed for the purpose, considerable improvements had been effected in

*This resolution was adopted by the Imperial Conference, 1926.

the salaries of agricultural officers and information with regard to the improved careers offered had been widely broadcast in the training centres. By these means it was hoped that satisfactory recruitment would be ensured as soon as these institutions had had time to resume their normal output of graduates. An improvement did certainly take place, but it was insufficient to meet the growing demand. An authoritative committee was therefore set up in 1924 under the chairmanship of Viscount Milner, who was succeeded on his death by Lord Lovat. This Committee produced an Interim Report in 1925 with special application to recruitment and training. Its full Report, which embraces wide questions affecting Research and the organisation of Agricultural Departments, has lately been published,* and has been circulated to members of the Conference.

As a result of the interim Report, a system of Agricultural Scholarships was instituted, and the first selection took place in 1925. There are from sixteen to eighteen scholarships a year. They are normally held for two years, the first being spent in this country and the second usually at the Imperial College of Tropical Agriculture, Trinidad. The scholars form a pool, from which vacancies can be filled in the year their scholarships end. Men are selected and trained with an eye both to specialist appointments and to appointments in general agriculture, and the training is varied to suit each case on the advice of an expert committee which interviews the candidates. In general the scholars destined for specialist appointments do one year's work under an expert in their own line ; the men for administrative posts normally take a year's course at the Agricultural Economics Research Institute at Oxford, together with certain instruction in genetics, practical plant-breeding, statistical methods, and both seed and crop testing at Oxford and Cambridge. During their second year both classes obtain, in Trinidad, an introduction to agriculture under tropical conditions.

This scheme is still at an experimental stage, but the reports received on the progress of the men selected are encouraging, and I think it may safely be said that it is already attracting to the Agricultural Services men of a higher standard than the average obtained in the past. Moreover, they will have had two years' training in subjects chosen to fit them for their work, over and above the qualifications usually held by candidates for these Departments.

It will, too, be possible in future to vary the training in particular cases to suit the requirements of any highly specialised appointments, which it may be desired to create and which it would be difficult to fill satisfactorily from the open market. This can, however, only be done if the Colonial Government concerned gives at least two years' notice of its desire to create such a post.

*Cmd. 2825.

4. COLONIAL OFFICE : Committee on Research (1927).

In accordance with the recommendation of the Colonial Office Conference, the Secretary of State for the Colonies has appointed a committee, with the following terms of reference :—

> " To formulate practical proposals, for submission to the Colonial Governments, to give effect to the resolution of the Colonial Office Conference on the subject of Colonial agricultural scientific and research services. These proposals should include a scheme, based on contribution to a common pool, for the creation of a Colonial agricultural scientific and research service available for the requirements of the whole Colonial Empire, for the support of institutions needed for that purpose, and for the increase of research and study facilities in connection with the specialist agricultural services of the Colonies generally."

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5. RESOLUTION PASSED AT THE IMPERIAL BOTANICAL CONFERENCE, 1924.

(4) That this meeting, fully aware of the necessity for co-ordination of botanical work in all parts of the Empire and recognising that both investigators and undergraduates will benefit by contact with fresh points of view, urges that every effort be made to encourage the exchange both of members of the staff and of research students between the Universities and Research Institutions of the Empire, and recommends the establishment of a permanent committee for this purpose.

Extract from Minutes of Meeting of the Interdepartmental Conference on Co-ordination of Scientific Research on 22nd February, 1927.

Questions arising from an informal meeting between Overseas representatives attending the Imperial Conference and members of the Interdepartmental Conference on the 2nd December, 1926.

The following matters were reported :—

(a) *Exchange of Scientific Personal.*

* * * *

A cognate question had arisen independently from an application by the Permanent Committee of the Imperial Botanic Conference, passed to the Empire Marketing Board, for a grant to assist the circulation of botanists in different parts of the Empire. It was agreed that the principle involved was of wider application than to the field of botany, and that the general question of the circulation of scientific workers, other than those in Government employ, should be referred to the Committee of Civil Research.

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6. AGRICULTURAL RESEARCH AND ADMINISTRATION IN THE NON-SELF-GOVERNING DEPENDENCIES.

(Lovat Committee.)

Extract from Part I of Report.

Study Leave.

64. The question of granting adequate facilities for study leave to officers in the Colonial agricultural departments is one which we consider to be of great importance. It is, however, so closely connected with the conditions of service generally that we propose to consider it more fully in connection with Part IV of our Report. Nevertheless, we think it right to mention it here as we have reason to hope that the Trustees of the Rockefeller Funds might be prepared, in the event of the proposals in this report being adopted, to make material contributions to the expense of officers undertaking research during periods of study leave. We feel that Colonial Governments should be aware of this possibility when considering the proposals outlined in this report.

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Extract from Part 4 of Report.

139. The provision of adequate study leave for officers of Colonial agricultural departments is a matter to which we drew special attention in Part I of this report. The question seems to us to be no less important for the agricultural officer than for the medical officer, the only class of officer for whom special study leave regulations have as yet been drawn up.

It is desirable that officers on vacation leave should in appropriate cases visit the Imperial Institute, the Bureaux of Entomology and Mycology, the Rothamsted Experimental Station, the Royal Botanic Gardens, Kew, and other centres, in order to acquaint themselves with the latest developments in their branches of agriculture. But facilities should be given to officers to take a definite period of study leave after they have had some years' service. Apart from the question of granting officers facilities for courses at recognised training centres, we would draw attention to the great benefit which experienced officers would derive from a visit to one of the important centres of production of the crops with which they are concerned. Officers concerned with cotton, might, for example, visit the American cotton field.

It is important that the facilities, when provided, should be such as will enable officers to take an approved course without sacrifice of leave or pay. Officers should also be assisted with books and equipment.

* * * *

7. BRITISH WEST AFRICAN AGRICULTURAL CONFERENCE HELD AT IBADAN, MARCH, 1927.

Resolution No. 10.

(*d*) The Committee recommend that the following expression of opinion should be forwarded by this Conference to the Agricultural Research Conference to be held in England this Autumn (1927).

(i) The Chemical Committee of the West African Research Conference is of the opinion that a Bureau of Soil Science, including a tropical section, would be of great value.

(ii) The Committee suggest that the functions of such a Bureau should include—

* * * *

(*b*) Machinery for assisting Agricultural Chemists in the Colonies to carry forward research on fundamental problems beyond the point possible in Colonial laboratories where staff and other facilities are limited. It is suggested that the existing research institutions, such as Rothamsted, could be utilised to carry out work of the nature indicated. What is wanted is some method of getting the research worker in the colony into direct contact with any specialist engaged in investigating the particular problem on which information is needed.

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8. UNION OF SOUTH AFRICA.

Division of Chemistry: Department of Agriculture.

Memorandum on "Inauguration of a System of Interchange of Agricultural Chemists between Institutions such as Rothamsted and Institutions Engaged on Similar Work in other States of the Empire."

In asking a Conference such as the Imperial Agricultural Research Conference to discuss the question of the inauguration of a system under which a regular interchange of chemists between agricultural research institutions in England and the other States of the Empire could be arranged there is little need to bring forth reasons to show

that such interchange must of necessity be a factor of very great value in assisting the attainment of that co-operation between the investigators scattered over the Empire which is so necessary for the due progress of Agricultural Research.

In Rothamsted the Empire possesses a world-famous research station. During the past 80 years of its existence it has established experiments, accumulated data, developed methods of research from the study of which the younger states have benefited to a degree to which it is impossible to assess a value. But the information which this station vouchsafes comes to us by way of the written word and an occasional research student. Valuable—very valuable—as is the information that thus accrues to workers in the distant Dominions, knowledge obtained by means of books can never be as convincing as that gained by personal observation. After all the personal touch is the impelling force in human nature. A personal acquaintance with the organisation and methods of scientific and other experts of another country cannot but lead to a far better understanding than is obtained through less direct channels and results in greater efficiency in the conduct of agricultural research.

While basic principles apply in any part of the world, the application of these principles in any particular country requires to be specially studied with reference to the conditions peculiar to that country. For this reason, therefore, in South Africa for instance, we may find it necessary to view problems under investigation in other lands from somewhat different angles and workers in England are likely to find in coming to South Africa that there exist aspects of the enquiries prosecuted in Europe which have not as yet come under their notice or which though of lesser importance in one set of conditions, in another set merit greater attention.

They would thus be able to test their knowledge in South Africa under conditions which could not be obtained in England. This is likely to lead to the discovery of further facts and the elucidation of phenomena which previously had been difficult of explanation.

As to the details of the financial arrangements which such a system would involve, these will be required to be carefully considered by the Conference. Perhaps the simplest arrangement would be for the institution of which an official is a member to undertake the payment of the salary of its officer (plus any adjustment on account of varying cost of living) but leaving the visited institution to find funds for travelling, apparatus, &c., up to a previously specified amount.

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9. CEYLON DEPARTMENT OF AGRICULTURE : Memorandum.

Provision for Specialists to visit other Colonies and Protectorates

The need is often felt by research officers of Agricultural Departments in the tropics for visits to other Colonies and Protectorates.

Such visits, even if only of a short duration, would be of the greatest value when specialists were working on a common problem. Entomological problems, involving the study of parasites, often demand such visits to other countries, but the importance of what may be after all only a fruitless search is sometimes difficult to recognise. Modern mycological research shows more and more plainly how widespread certain fungi are and the interchange of visits between mycological officers might, if they could be arranged, save a considerable amount of duplication of labour. Recent mycological work in Ceylon has indicated the widespread occurrence of the fungus *Rhizoctonia bataticola* in connection with root disease of economic and other crops. There is difficulty at times in finding the fungus and reports from any given region to the effect that the fungus is not present cannot always be accepted as final. It would be of value to Ceylon to know whether this particular fungus is also of widespread occurrence in South India, Malaya and the Dutch East Indies and a visit to these countries by the Ceylon Mycologist would not only be of value to Ceylon but also to tropical agriculture in general. Other instances could be quoted, but the importance to Mauritius of the visit of the Director of the Imperial Bureau of Entomology to the West Indian Agricultural Conference of 1912 need only be mentioned to make the position clear. Individual Colonies are hardly likely to approve of expenditure of funds for services of a general rather than a particular character and the Conference is therefore invited to consider whether special funds could be set aside by the Empire Marketing Board or other organisation for such visits of specialists as have been outlined above.

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10. MEMORANDUM FROM THE GOLD COAST ON INTERCHANGE OF OFFICERS BETWEEN DEPARTMENTS OF AGRICULTURE.

Reference to a system of interchange of officers as one means of effecting co-ordination of agricultural research was made in the Circular despatch of the Secretary of State for the Colonies dated 24th August, 1926.

The effects of such interchange would be beneficial in the highest degree, and the benefits derivable would not be limited merely to the particular subject for which the interchange was effected. Of all subjects, tropical agriculture is probably the one in which wide and diverse experience is most necessary.

In the tropics, where Departments of Agriculture have to deal with peoples of primitive organisation and knowledge, a sound Government policy of propaganda and stimulation is especially necessary. Definite agricultural policy is a comparatively recent

development on the part of tropical Governments and co-ordination and comparison of the different attempts are of unusual importance.

In addition to questions of policy, Departments of Agriculture are faced with a dearth of accurate information concerning the crops which they are called upon to direct and administer. Knowledge lacking in one country is often available in others, and in general it is sounder policy for a Department to obtain such knowledge by sending one of its own officers than by securing the services of a temporary expert. With a system of exchange of officers both countries concerned would benefit and each Department obtain a permanent addition to its store of available knowledge.

In the case of the Gold Coast, the benefits to be obtained from a system of exchange are probably greater than in the case of more advanced countries. Among the subjects on which information would be of especial benefit may be mentioned Co-operative Credit work in India and Ceylon, the Schools and Home Gardens movement in Ceylon, the organisation of the Agricultural Instructor Staff in Ceylon, the Special Crop Research Schemes in Malaya and Ceylon, oil palm plantations industry in Malaya, the Farm Schools of Ceylon, the Sugar Industry of Mauritius, the methods of preparations of Foresters' Cocoa in Grenada, cotton cultivation including irrigation in Sudan, coconuts in Fiji, different kinds of food crops, *e.g.*, swamp rice, maize and duoll in the East.

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11. MEMORANDUM FROM DEPARTMENT OF AGRICULTURE, NYASALAND.

Leave Study and Research Work.

Research work in the more restricted senses of the expression must of necessity be partly neglected in the smaller Departments of Agriculture owing to the pressing claims on the time of technical officers in connection with their routine duties; and any measures that can be devised to stimulate the prosecution of research investigations, in spite of the difficulties under which many scientific officers have to work in tropical countries, would be welcomed by the officers themselves and would do much to strengthen the work of local Departments of Agriculture.

A very important step towards this end would be the provision in Great Britain and Ireland of adequate facilities for special study and for research work by officers on leave. There are at present many institutions at home at which advice and assistance of various kinds are freely given to agricultural officers on vacation, and the officers are deeply appreciative of the opportunities of study placed at their disposal; but, the subject of leave study and research

investigations, in its many aspects, could with advantage be discussed by the Conference with a view to the outlining of a scheme for placing the whole question on a more systematic basis.

The delegates from abroad would be able to place definitely before the Conference the needs of their departments in regard to this matter ; and the home delegates would be able to decide what action is likely to prove feasible in practice.

Scientific officers in countries where leave is regular would it is believed be glad to voluntarily devote a portion of their leave to special studies, unless private affairs or health consideration made such action undesirable. The amount of support that would be given by local Governments to any proposals that may be advanced would, doubtless, be in direct ratio to the facilities afforded for the investigation of problems of primary importance to the countries concerned.

It is recognised that many practical difficulties have to be overcome, but there are few measures that could with greater confidence be relied upon to assist the work of Departments of Agriculture in the outposts of the British Empire, and it is urged that this matter should receive sympathetic consideration at the Imperial Agricultural Research Conference.

12. FACILITIES AVAILABLE IN GREAT BRITAIN FOR OVERSEAS VETERINARY RESEARCH WORKERS.

Name of Institution.	Directed by.	No. of overseas workers that can be accommodated.	Principal diseases at present under investigation.	Type of work for which facilities are available.	Remarks.
Institute of Animal Pathology, Royal Veterinary College, London, N.W.1	F. C. Minett, B.Sc. M.R.C.V.S.	3	Animal Pathology Bacterial and parasitic diseases.	General facilities for any of these.	
Institute of Animal Pathology, Cambridge University.	Prof. J. B. Buxton, F.R.C.V.S.	3	Animal Pathology. Bacterial Infections.		
Institute of Agricultural Parasitology: London School of Hygiene and Tropical Medicine, 23, Endsleigh Gardens, Euston Road, N.W. 1.	Prof. R. T. Leiper, M.D., D.Sc., F.R.S.	3	Parasitology, especially internal parasites of stock.	Morphology and classification, life history, bionomics, bibliography technique.	The Institute has a field station near St. Albans
Department of Veterinary Pathology, Liverpool, University.	Prof. S. H. Gaiger, F.R.C.V.S.	Variable, according to the nature of the work to be done.	Animal Pathology, Bacterial Infections at the Tropical School of Medicine, Protozoal and Parasitic diseases.	The Liverpool School of Tropical Medicine and the Department of Biochemistry, Pathology and Bacteriology in the University have undertaken to place their resources at the disposal of overseas veterinary research workers.	
Animal Diseases Research Association, Moredun Institute, Gilmerton, Edinburgh.	W. A. Pool, M.R.C.V.S.	4	Bacterial infections and immunology.	Animal Diseases.	

Royal (Dick) Veterinary College, Edinburgh, University.	O.C.Bradley,M.D., D.Sc.	2 or 3 2	Animal Pathology. Animal Hygiene and Dietetics.		
Ministry of Agriculture, Veterinary Laboratory, New Haw, Weybridge, Surrey.	W. H. Andrews, D.Sc.,M.R.C.V.S.	2	Foot-and-Mouth Disease, Swine Fever, Contagious abortion, Scrapie, Lamb dysentery.	General pathological and bacteriological work on the larger domesticated animals, as well as on the usual laboratory animals. Facilities for isolation and the study of infectious diseases.	Strains of Babesia bigemina and bovis, and of Anaplasma marginale maintained.
Poultry diseases section.	T. M. Doyle, F.R.C.V.S. D.V.S.M.	2	Bacillary White Diarrhœa, Fowl Pox, Tuberculosis.	Research on methods of diagnosis and on other aspects of the contagious diseases of poultry.	
Foot-and-Mouth Disease, Experimental Station, Pirbright, Surrey	W. H. Andrews, D.Sc., M.R.C.V.S.	1	Foot-and-Mouth Disease.	Foot - and - Mouth Disease.	
Lister Institute of Preventive Medicine, Chelsea Bridge Road, S.W. 1.	Prof. C. J. Martin, C.M.G., F.R.S.	2	Immunology, Bacteriology, Protozoology.		
National Institute for Medical Research, Mount Vernon, London, N.W. 3.	Capt.S.R.Douglas, F.R.S., Director of Department of Experimental Pathology.	According to space available.	Bacteriology, Immunology and Filterable Viruses.		Small animals and a limited number of larger ones when necessary.